IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application. An identifier indicating the status of each claim is provided.

Listing of Claims

1. (Previously Presented) A digital-signal processing apparatus for converting an input digital signal, comprising:

envelope calculation means for calculating the envelope of the input digital signal;

class classification means for classifying the input digital signal into a class according to the calculated envelope; and

prediction calculation means for prediction-calculating the input digital signal by a prediction method corresponding to the class to generate a digital signal converted from the input digital signal,

wherein the digital signal is provided to an output device, and

wherein the envelope calculation means calculates a positive envelope in a positive region of the input signal and a negative envelope in a negative region of the input signal.

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2. (Original) The digital-signal processing apparatus according to claim 1, wherein

the input digital signal is a digital audio signal.

3. (Original) The digital-signal processing apparatus according to claim 1, wherein

the prediction calculation means uses prediction coefficients generated in advance by learning according to a desired digital signal.

4. (Currently Amended) A digital-signal processing system comprising:

at least one processor; and

at least one memory, coupled to the at least one processor, the at least one memory storing a method for converting an input digital signal, the method comprising:

an envelope calculation step of calculating the envelope of the input digital signal;

a class classification step of classifying the input digital signal into a class according to the calculated envelope;

a prediction calculation step of prediction-calculating the input digital signal by a prediction method corresponding to the class to generate a digital signal converted from the input digital signal; and

providing the digital signal to an output device, and

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wherein the envelope calculation step calculates a positive envelope in a positive region of the input signal and a negative envelope in a negative region of the input signal.

5. (Original) A digital-signal processing method according to claim 4, wherein

the input digital signal is a digital audio signal.

6. (Original) A digital-signal processing method according to claim 4, wherein

the prediction calculation step, prediction coefficients generated in advance by learning according to a desired digital signal are used.

7. (Previously Presented) A learning apparatus for generating prediction coefficients used by prediction calculation in a conversion processing of a digital-signal processing apparatus for converting an input digital signal, comprising:

apprentice-digital-signal generating means for generating an apprentice digital signal obtained by making a desired digital signal worse;

envelope calculation means for calculating the envelope of the apprentice digital signal;

class classification means for classifying the apprentice digital signal into a class according to the calculated envelope; and

prediction-coefficient calculation means for calculating the prediction coefficients corresponding to the class according to the input digital signal and the apprentice digital signal, wherein the prediction coefficients are provided to an output device.

8. (Original) A learning apparatus according to claim 7, wherein the input digital signal is a digital audio signal.

9. (Currently Amended) A learning system comprising:

at least one processor; and

at least one memory, coupled to the at least one processor, the at least one memory storing a method for generating prediction coefficients used by prediction calculation in a conversion processing of a digital-signal processing apparatus for converting an input digital signal, the method comprising:

an apprentice-digital-signal generating step of generating an apprentice digital signal obtained by making a desired digital signal worse;

an envelope calculation step of calculating the envelope of the apprentice digital signal;

a class classification step of classifying the apprentice digital signal into a class according to the calculated envelope;

a prediction-coefficient calculation step of calculating the prediction coefficients corresponding to the class according to the input digital signal and the apprentice digital signal; and

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providing the prediction coefficients to an output device.

10. (Original) A learning method according to claim 9, wherein the input digital signal is a digital audio signal.

11. (Previously Presented) A digital-signal processing apparatus for converting an input digital signal, comprising:

envelope calculation means for calculating the envelope of the input digital signal;

class classification means for classifying the digital signal into a class according to the calculated envelope;

envelope prediction calculation means for calculating a new envelope by a prediction method corresponding to the class;

carrier extracting means for extracting a carrier from the input digital signal; and

modulation means for modulating the carrier according to the new envelope calculated by the envelope prediction calculation means to generate a new digital signal converted from the input digital signal,

wherein the new digital signal is provided to an output device.

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12. (Original) A digital-signal processing apparatus according to claim 11, wherein

the input digital signal is a digital audio signal.

13. (Original) A digital-signal processing apparatus according to claim 11, wherein

the envelope prediction calculation means uses prediction coefficients generated in advance by learning according to a desired digital signal.

14. (Currently Amended) A digital-signal processing system comprising:

at least one processor; and

at least one memory, coupled to the at least one processor, the at least one memory storing a method for converting an input digital signal, the method comprising:

an envelope calculation step of calculating the envelope of the input digital signal;

a class classification step of classifying the digital signal into a class according to the calculated envelope;

an envelope prediction calculation step of calculating a new envelope by a prediction method corresponding to the class;

a step of extracting a carrier from the input digital signal;

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a step of modulating the carrier according to the new envelope calculated in the envelope prediction calculation step to generate a new digital signal converted from the input digital signal; and

providing the new digital signal to an output device.

15. (Original) A digital-signal processing method according to claim 14, wherein

the input digital signal is a digital audio signal.

16. (Original) A digital-signal processing method according to claim 14, wherein

in the envelope prediction calculation step, prediction coefficients generated in advance by learning according to a desired digital signal are used.

17. (Previously Presented) A learning apparatus for generating prediction coefficients used by prediction calculation in a conversion processing of a digital-signal processing apparatus for converting an input digital signal, comprising:

apprentice-digital-signal generating means for generating an apprentice digital signal obtained by making a desired digital signal worse;

first envelope calculation means for calculating the envelope of the apprentice digital signal;

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class classification means for classifying the apprentice digital signal into a class according to the calculated envelope;

second envelope calculation means for calculating the envelope of the input digital signal; and

prediction-coefficient calculation means for calculating the prediction coefficients corresponding to the class according to the envelope of the apprentice digital signal, calculated by the first envelope calculation means and the envelope of the input digital signal, calculated by the second envelope calculation means,

wherein the prediction coefficients are provided to an output device.

18. (Original) A learning apparatus according to claim 17, wherein the input digital signal is a digital audio signal.

19. (Currently Amended) A learning system comprising:

at least one processor; and

at least one memory, coupled to the at least one processor, the at least one memory storing a method for generating prediction coefficients used by prediction calculation in a conversion processing of a digital-signal processing apparatus for converting an input digital signal, the method comprising:

an apprentice-digital-signal generating step of generating an apprentice digital signal obtained by making a desired digital signal worse;

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a first envelope calculation step of calculating the envelope of the apprentice digital signal;

a class classification step of classifying the apprentice digital signal into a class according to the calculated envelope;

a second envelope calculation step of calculating the envelope of the input digital signal;

a prediction-coefficient calculation step of calculating the prediction coefficients corresponding to the class according to the calculated envelope of the apprentice digital signal and the calculated envelope of the input digital signal; and

providing the predicted coefficient to an output device.

20. (Original) A learning method according to claim 19, wherein the input digital signal is a digital audio signal.

21. (Previously Presented) A program storage medium for making a digital-signal processing apparatus execute a program which is recorded on said program storage medium, the program comprises:

an envelope calculation step of calculating the envelope of an input digital signal;

a class classification step of classifying the input digital signal into a class according to the calculated envelope; and

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a prediction calculation step of prediction-calculating the input digital signal by a prediction method corresponding to the class to generate a digital signal converted from the input digital signal,

wherein said digital signal is provided to an output device, and

wherein the envelope calculation step calculates a positive envelope in a positive region of the input signal and a negative envelope in a negative region of the input signal.

22. (Previously Presented) A program storage medium for making a learning apparatus execute a program which is recorded on said program storage medium, the program comprises:

an apprentice-digital-signal generating step of generating an apprentice digital signal obtained by making a desired digital signal worse;

an envelope calculation step of calculating the envelope of the apprentice digital signal;

a class classification step of classifying the apprentice digital signal into a class according to the calculated envelope; and

a prediction-coefficient calculation step of calculating the prediction coefficients corresponding to the class according to the digital signal and the apprentice digital signal,

wherein the prediction coefficients are provided to an output device.

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23. (Previously Presented) A program storage medium for making a digital-signal processing apparatus execute a program which is recorded on said program storage medium, the program comprises:

an envelope calculation step of calculating the envelope of an input digital signal;

a class classification step of classifying the digital signal into a class according to the calculated envelope;

an envelope prediction calculation step of calculating a new envelope by a prediction method corresponding to the class;

a carrier extracting step of extracting a carrier from the input digital signal; and

a modulation step of modulating the carrier according to the new envelope calculated by the envelope prediction calculation means to generate a new digital signal converted from the input digital signal,

wherein said digital signal from said storage medium is provided to an output device.

24. (Previously Presented) A program storage medium for making a learning apparatus execute a program which is recorded on said program storage medium, the program comprises:

an apprentice-digital-signal generating step of generating an apprentice digital signal obtained by making a desired digital signal worse;

an envelope calculation step of calculating the envelope of the apprentice digital signal;

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a class classification step of classifying the apprentice digital signal into a class according to the calculated envelope;

a second envelope calculation step of calculating the envelope of the input digital signal; and

a prediction-coefficient calculation step of calculating the prediction coefficients corresponding to the class according to the calculated envelope of the apprentice digital signal and the calculated envelope of the digital signal,

wherein the prediction coefficients are provided to an output device.

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